LR1262 LoRaWAN Node Module DataSheet

V1.0

Table of Contents

1 Overview

1.1 Description

The LR1262 node module incorporates the SiP chip STM32WLE5CCU6, which is a SoC integrating the LoRa® RF and MCU chip combination. It embeds an ultra-low-power ARM Cortex-M4 MCU and the LoRa® SX126X. This module supports various communication modes, including (G)FSK modulation and LoRa® spread spectrum communication technology, thus meeting communication requirements in different scenarios.In LoRa communication mode, the module supports P2P communication and also has seamless connectivity with LoRaWAN networks. It can easily connect to mainstream LoRaWAN server platforms such as The Things Network (TTN) to achieve efficient data transmission between devices and the cloud.

The module provides users with a rich set of peripheral interfaces, including UART, I2C, SPI, ADC, and GPIO, which can meet a variety of hardware extension requirements. Through the UART interface, users can flexibly configure the communication mode and operational parameters of the module using AT commands. In addition, based on the STM32WLE5CCU6 microcontroller within the module, users can conduct software development and perform program erasure and programming via the SWD interface, thereby further enhancing the customizability and

application flexibility of the module.

1.2 Features

- Based on STM32WLE5CCU6
- Compliant with LoRaWAN 1.0.3 Specification
- Supports EU868 and US915 Frequency Bands
- LoRaWAN Activation via OTAA/ABP
- LoRa Point-to-Point (P2P) Communication
- Developed for Keil
- User-friendly AT Command Set via UART Interface
- Ultra-low Power Consumption of 1.69μA in Sleep Mode
- Operating Voltage: 2.0 V to 3.6 V
- Temperature Range: -40°C to 85°C

1.3 Applications

- Development of LPWAN Gateway Devices
- Development of Any Remote Wireless Communication Applications
- Learning and Research of LoRa® and LoRaWAN® Applications

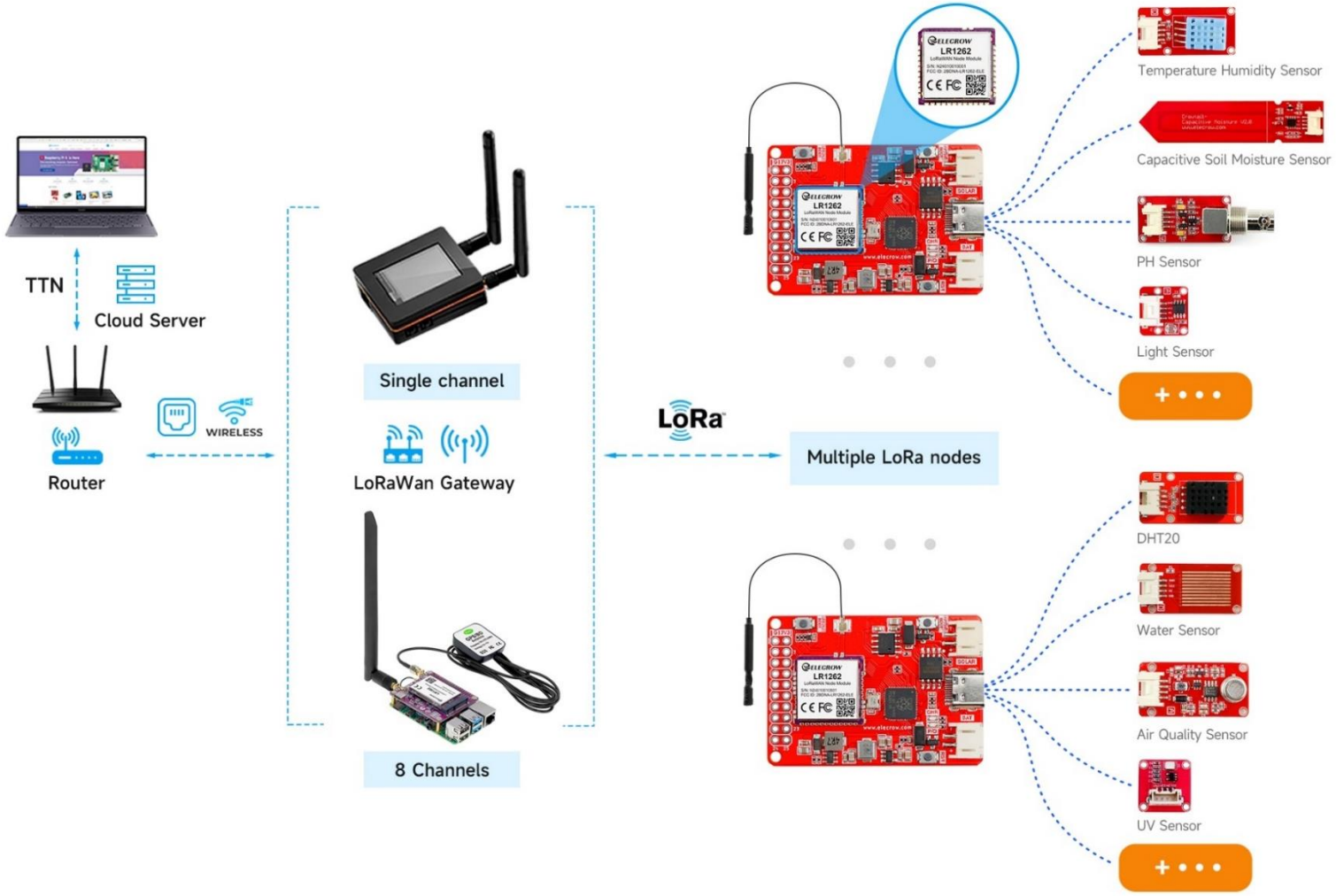

Figure 1 Network Topology Diagram

2 Product Appearance Diagram

Figure 2 Front View

Figure 3 Right View

Figure 4 Rear View

3 Dimension Drawing

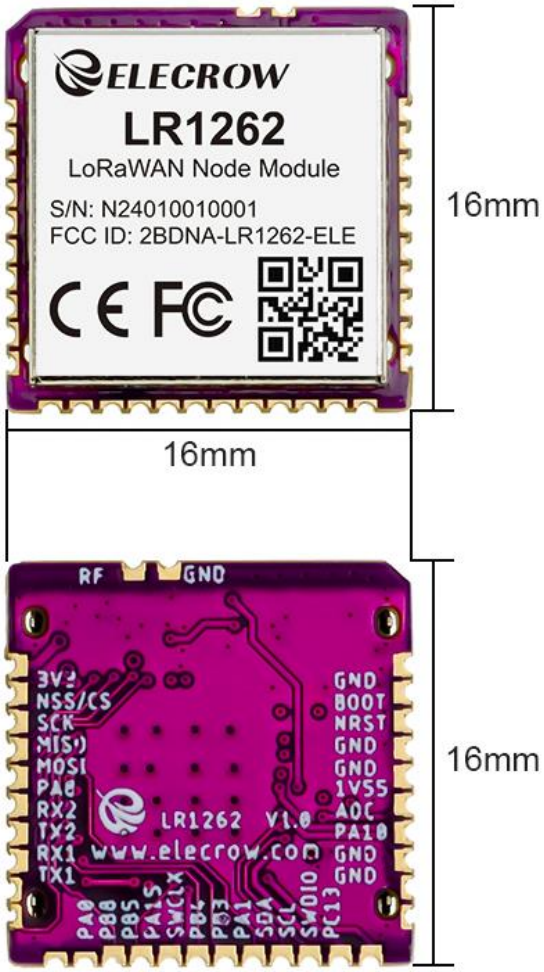

Figure 5 Dimension Drawing

4 System Block Diagram

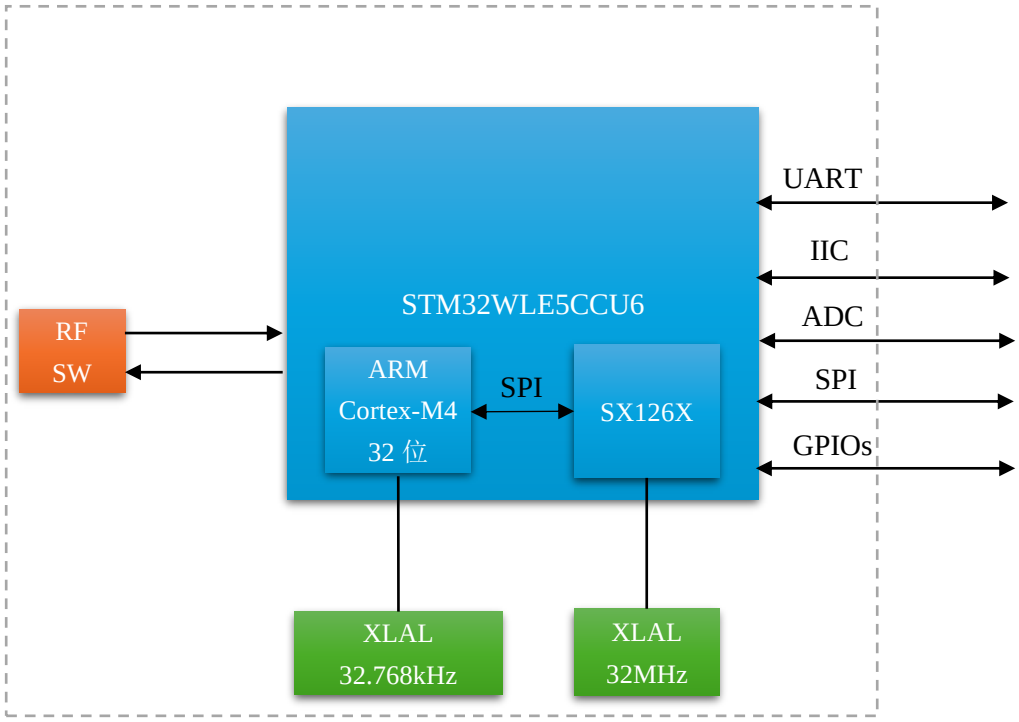

Figure 6 System Block Diagram

5 Technical Specifications

No.	Category	Item	Parameter
1	MCU	Processor	STM32WLE5CCU6（ARM Cortex-M4 32-bit）
2		RAM	64KB
3		Flash	256KB(with ECC)
4	RF Characteristics	RF Chip	SX1262
5		TX Transmission Power	20dBm@Max（868/915MHz）
6		RX Sensitivity	-123 dBm for 2-FSK(at 1.2 Kbit/s) -148 dBm for LoRa®(at 10.4 kHz, spreading factor 12)
7		LoRaWAN® Protocol	Class A/B/C (compliant with LoRaWAN 1.0.3 specification)
8		Supported Bands	EU8685、US915
9		Frequency Range	150 MHz to 960 MHz
10		Airspeed	0.018~62.5 Kbit/s
11		signal modulation	LoRa®、（G）FSK、（G）MSK 、BPSK
12		Communication Distance	5~7 KM
13		Operating Voltage	3.3V
14	Mechanical Characteristics	Antenna Type	Supports stamp holes or IPEX antenna mounts
15		Packaging Type	32pin SMT, stamp hole, 32-pin, tight I/O port, for PCB SMT installation
16		Dimensions	15 * 15 * 2.5mm
17		Weight	3g
18	Interface	Communication Interface	UART/SPI
19		Peripheral interface	UART, I2C, SPI, ADC, GPIO

6 Hardware Overview

Hardware Overview discusses the pin layout of the LR1262 node module and its corresponding functions.

6.1 LR1262 Node Module Pin Definition

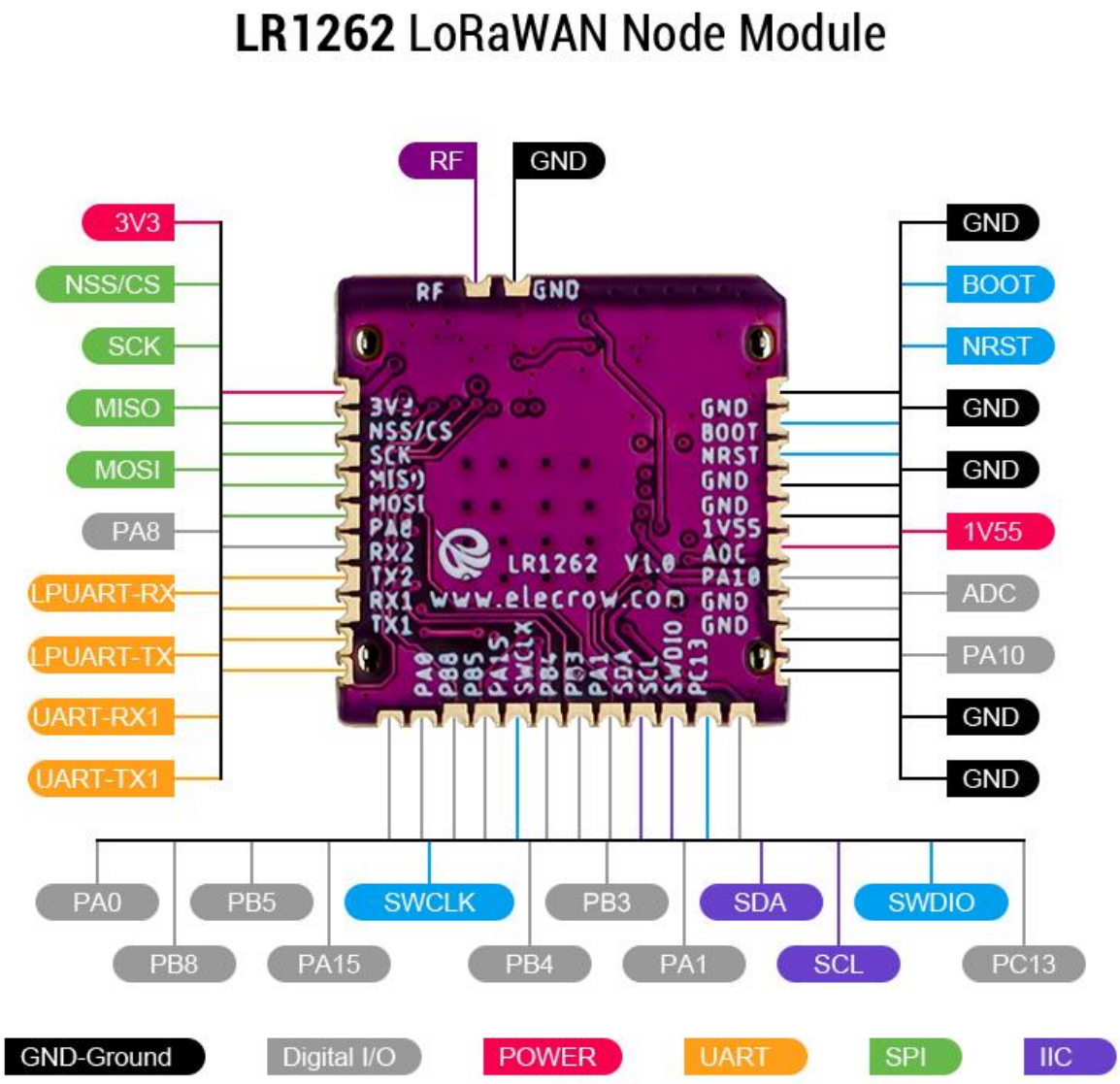

Figure 7 LR1262 Pin Definition Diagram

The table below provides the pin function definitions and descriptions for the LR1262 node module.

No.	Name	Type	STM32WLE5CCU6 Pin	Description
1	GND	-	-	Ground
2	BOOT	I/O	PH3-BOOT0	Boot
3	NRST	I/O	NRST	Reset
4	GND	GND	-	Ground
5	GND	GND	-	Ground
6	VDDRF_1V55	P	VDDRF_1V55	RF section 1.55V power input
7	ADC	I/O	PB2	ADC
8	PA10	I/O	PA10	GPIO
9	GND	-	-	Ground
10	GND	-	-	Ground
11	PC13	I/O	PC13	GPIO
12	SWDIO	I/O	PA13	SWD debug pin
13	SCL	I/O	PA12	I2C (SCL)
14	SDA	I/O	PA11	I2C (SDA)
15	PA1	I/O	PA1	GPIO
16	PB3	I/O	PB3	GPIO
17	PB4	I/O	PB4	GPIO
18	SWCLK	SWD	PA14	SWD debug pin
19	PA15	I/O	PA15	GPIO
20	PB5	I/O	PB5	GPIO
21	PB8	I/O	PB8	GPIO
22	PA0	I/O	PA0	GPIO
23	UART-TX1	O	PB6	For UART1 transmission
24	UART1-RX1	I	PB7	For UART1 reception
25	LPUART-TX	O	PA2	For LPUART transmission
26	LPUART-RX	I	PA3	For LPUART reception

27	PA8	I/O	PA8	GPIO
28	MOSI	I/O	PA7	SPI (MOSI)
29	MISO	I/O	PA6	SPI (MISO)
30	SCK	I/O	PA5	SPI (SCK)
31	NSS/CS	I/O	PA4	SPI (CS)
32	3V3-VDDRF	P	VDDRF	System 3.3V power input, must be connected to the LDO output or SMPS converter.
33	RF	I/O	-	RF data reception and transmission
34	GND	-	-	Ground

For detailed pin functions of the STM32WLE5CCU6, including Alternate Functions and Additional Functions, please refer to page 55 of the documentation linked below:

- **STM32WLE5CCU6 Datasheet**

7 Interfaces Function

7.1 Power Interface

No.	Power Supply Pin	Pin Type	Function Description
1	3V3-VDDRF	PI	System 3.3V power input, must be connected to the LDO output or SMPS converter.
2	VDDRF1V55	PI	RF section 1.55V power input
3	GND	PI	Ground

7.2 UART Interface

No.	UART Interface Signal	Pin Type	Function Description	Voltage Domain
1	UART1-TX	I/O	General-purpose asynchronous transmit pin for UART1 transmission	3.3V
2	UART1-RX	I/O	General-purpose asynchronous receive pin for UART1 reception	3.3V
3	LPUART-TX	I/O	Low-power general-purpose asynchronous transmit pin for LPUART transmission	3.3V
4	LPUART-RX	I/O	Low-power general-purpose asynchronous receive pin for LPUART reception	3.3V

7.3 SPI Interface

No.	SPI Interface Signal	Pin Type	Function Description	Voltage Domain
1	NSS/CS	I/O	SPI Chip select signal input	3.3V
2	SCK	I/O	SPI clock signal input	3.3V
3	MISO	I/O	SPI data output	3.3V
4	MOSI	I/O	SPI data input	3.3V

7.4 I2C Interface

No.	I2C Interface Signal	Pin Type	Function Description	Voltage Domain
1	SCL	I/O	I2C clock line, used for I2C communication clock signal	3.3V
2	SDA	I/O	I2C data line, used for I2C communication data transfer	3.3V

7.5 ADC Interface

No.	ADC Interface Signal	Pin Type	Function Description	Voltage Domain
1	ADC	I/O	Analog-to-digital converter pin, used for digitizing analog signals	3.3V

7.6 SWD Debug Interface

No.	Debug Interface Signal	Pin Type	Function Description	Voltage Domain
1	SWDIO	I/O	Debug and programming interface pin, used for data transmission	3.3V
2	SWCLK	I/O	Debug and programming interface pin, used for transmitting clock signals (synchronizing data)	3.3V

7.7 GPIOs Interface

No.	IO Interface Signal	Pin Type	Function Description	Voltage Domain
1	PA0	I/O	Multi-purpose GPIO	3.3V
2	PA1	I/O		3.3V
3	PA8	I/O		3.3V
4	PA10	I/O		3.3V
5	PA15	I/O		3.3V
6	PB3	I/O		3.3V
7	PB4	I/O		3.3V
8	PB5	I/O		3.3V
9	PB8	I/O		3.3V
10	PB15	I/O		3.3V
11	PC13	I/O		3.3V

8 Electrical Characteristics

8.1 Power Consumption

NO.	Mode	Minimum	Typical	Maximum
1	TX Current	/	87 mA@20dBm 868Mhz	/
2	RX Current	/	5.2 mA	/
3	Minimum Sleep Current	1.69μA	/	2.0μA

9 Environmental Characteristics

9.1 Extreme Operating Conditions

NO.	Item	Description	Minimum	Maximum	Unit
1	VCCmr	Supply Voltage	1.71	3.6	V
2	Tmr	Ambient Temperature	-40	+85	℃

9.2 Normal Operating Conditions

NO.	Item	Description	Minimum	Maximum	Unit
1	VCCop	Supply Voltage	1.8	3.0	V
2	Top	Ambient Temperature	-30	+85	℃

10 Application Information

10.1 Package Information

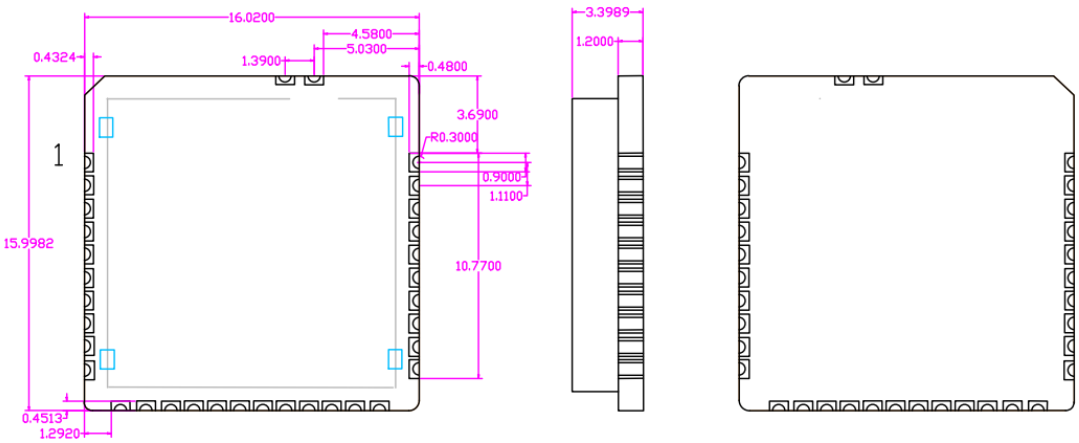

Figure 8 Package Outline Drawing (Unit:mm)

10.2 Land Pattern

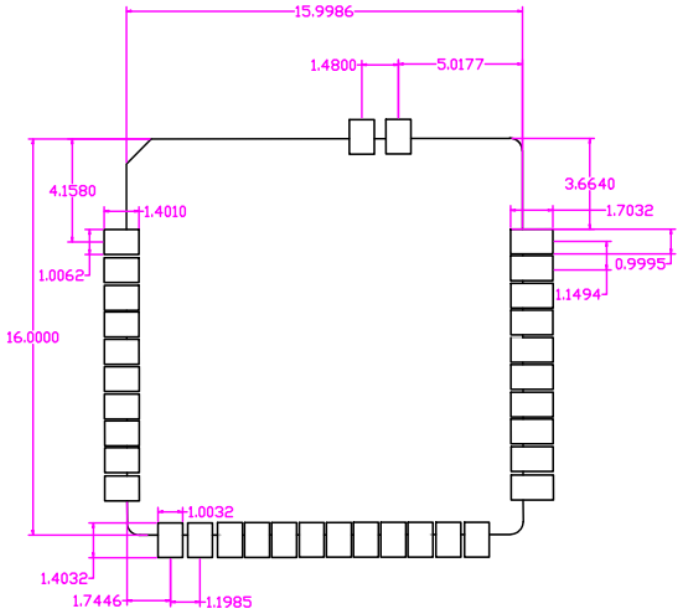

Figure 9 PCB Layout (Unit:mm)

10.3 Package Marking

Figure 10 Package Marking Diagram

11 Certifications

12 Related Documents and Ordering Information

12.1 Related Documents

- **LR1262 LoRaWAN Node Module Product Link**
- **LR1262 LoRaWAN Node Module WIKI**
- **LR1262 LoRaWAN AT Command Description**
- **STM32WLE5CCU6 Datasheet**

12.2 Ordering Information

Sku	Product Name	Product Image
CRT01268N	LR1262 LoRaWAN Node Module	
CRT01269N	LR1262 Node Board	
CRT01267D	LoRaWAN LR1262 Development Board	
CRT01158H	Crowtail- LoRaWAN Lora RA-08H/LR1262 Module	

13 Revision History

Date	Version	Release Notes
2025/4/18	V1.0	Initial Release
2025/5/14	V1.1	Update module pin functions